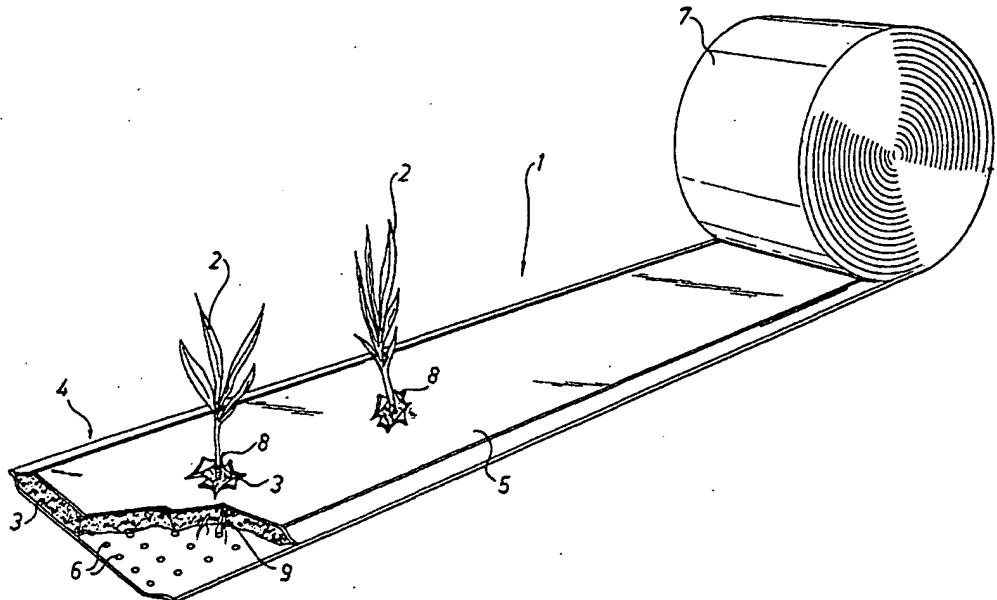




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A01G 9/10 // 31/00		A1	(11) International Publication Number: WO 94/22287 (43) International Publication Date: 13 October 1994 (13.10.94)
(21) International Application Number: PCT/SE94/00275			(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 28 March 1994 (28.03.94)			
(30) Priority Data: 9301047-8 30 March 1993 (30.03.93) SE			
(71) Applicant (for all designated States except US): VÄSTSALLAT AB [SE/SE]; S-440 80 Ellös (SE).			Published With international search report. In English translation (filed in Swedish).
(72) Inventors; and			
(75) Inventors/Applicants (for US only): HOLMSTRÖM, Anders [SE/SE]; Lärkträvägen 30, S-440 90 Henån (SE). LINDQVIST, Lars [SE/SE]; Stötekärrvägen 9 B, S-421 77 V Frölunda (SE).			
(74) Agent: AWAPATENT AB; P.O. Box 11394, S-404 28 Göteborg (SE).			

(54) Title: CULTIVATION SUBSTRATE



(57) Abstract

A substrate (1) for cultivation of plants, vegetables and the like (2) is composed of a fibrous pulp material in the form of fluff (3) and of a wrapping (4) enclosing said fluff. The upper face of said wrapping is slit to produce cuts (8) in which the plants, vegetables and the like (2) may be inserted.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	CTe d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

CULTIVATION SUBSTRATE

The subject invention concerns a substrate for cultivation of plants, vegetables and the like, such as 5 tomatoes, cucumbers and paprika but also roses, carnations and other flowers to be used as cut flowers.

Cultivators of plants, vegetables and the like as outlined above today often use, as the cultivation substrate, strips or mats of rock or glass fibre wool, that 10 is, of mineral wool. These strips or mats are comparatively narrow, having a width of say 7.5 cm. The supply of water and plant nutrient solutions therefore may be performed by drip-feeding, generally with the aid of one thin hose for each plant.

15 This type of mineral wool consists of rather short but above all sharp (fragile) fibres that are more or less densely compacted.

One consequence thereof is that large amounts of the 20 fibres separate and when the mats are manipulated in connection with the deposition thereof and removal from the support prior to the start of the cultivation and at the end thereof, these separated fibres become freely suspended in the air and thus constitute a considerable hazard to the health of the personnel, in addition to 25 which their presence is unsatisfactory from an environmental point of view.

Not being biodegradable, mineral wool, once the cultivation is completed, therefore must be pulled out and be transported to a deposition plant for destruction, with 30 consequential problems and costs.

The main purpose of the subject invention is to suggest a cultivation substrate exhibiting none of the disadvantages outlined above and being non-harmful to the consumers as well as the environment.

35 This purpose is achieved in that the substrate in accordance with the invention to an essential extent contains a fibrous pulp material which preferably

essentially consists of fluff and which preferably is packaged in an enclosing wrapping.

The invention will be described in closer detail in the following with reference to the accompanying drawing 5 figure which very schematically and in a perspective view illustrates an at present particularly preferred embodiment of the invention.

The substrate in accordance with the invention, designated generally by numeral 1 in the drawing, is 10 intended for cultivation of plants and vegetables 2 and the like, such as tomatoes, cucumbers and paprika, and essentially consists of a fibrous pulp material 3 which preferably is based on paper pulp, i.e. cellulose fibres.

Following a number of tests applicants have found 15 that the fibrous pulp material fluff, that is a material consisting of unbonded pulp fibres and fibre flocs, meets the requirements. The fluff 3 presently regarded to be the most suitable should be un-refined, that is, be withdrawn prior to the refining, and be freed of such substances as 20 nitro-ammonium compounds, sodium and sulphur, for instance by means of washing.

After such treatment, the fluff 3 is dried and it is preferably packaged in an enclosing wrapping 4, the latter, together with the fluff therein, thereafter being 25 flattened to give it essentially flat upper and lower faces 5, 6.

In accordance with the embodiment illustrated the wrapping 4 is formed from a suitable re-usable and/or bio-degradable synthetic resin, but obviously it could be made 30 from some other material that suits the required purpose, such as wet-strength paper or the like.

The substrate 1 composed of fluff 3 and the wrapping 4, preferably is configured as illustrated in the drawing figure, as a mat or a strip of optional length, and a 35 thickness and a width of say respectively 3 and 15 cm.

Naturally, these dimensions could be varied optionally according to wish.

To facilitate deposition of the substrate 1 on a support, not illustrated, such as the ground inside or outside a greenhouse prior to the start of the cultivation, and also removal/pulling out of the substrate 1 at 5 the end of the cultivation period, the substrate 1 preferably is respectively rolled into or coilable into an easily manageable roll 7. The substrate 1 of strip or mat configuration could also be used in connection with recirculative nutrient systems according to which the 10 substrate, after having been removed/pulled out, is transferred to a collection channel or the like for collection of the nutrients in the substrate.

The upper face 5 of the wrapping 4 may be cut by means of a conventional knife or similar cutting tool in 15 order to make cuts 8 in the substrate 1, deposited at the place of cultivation, in which cuts plants 2 may be inserted in such a way that the root system 9 of the plants 2 is ensured satisfactory and growth-promoting contact with the fluff 3.

20 Supply of water and nutrients then may be effected in a conventional, optional manner, and a depot supply of fertilizers according to choice in solid or liquid form may be admixed into the fluff 3.

For drainage purposes the lower face 5 of the 25 substrate cover 4 could of course be perforated or otherwise be made water-permeable.

At the end of the cultivation period, the watering is interrupted a few days before the substrate is to be pulled out, to allow the plants 2 to absorb the moisture 30 contained in the substrate 1. After harvesting of the plants 2, the dry substrate 1 together with any remaining vegetable matter also now dried-out, is rolled into a roll 7 to be transported to a depot to be used either as soil-improving material or to be incinerated.

35 The invention should not be regarded as limited to the embodiments thereof described in the foregoing and illustrated in the accompanying drawings but could be

4

modified in a variety of ways within the scope of the claimed protection.

5

10

15

20

25

30

35

CLAIMS

1. A substrate for cultivation of plants, vegetables and the like, characterized in that to an essential extent it contains a fibrous pulp material (3).

5 2. A substrate as claimed in claim 1, characterized in that the fibrous pulp material (3) is packaged inside an enclosing wrapping (4).

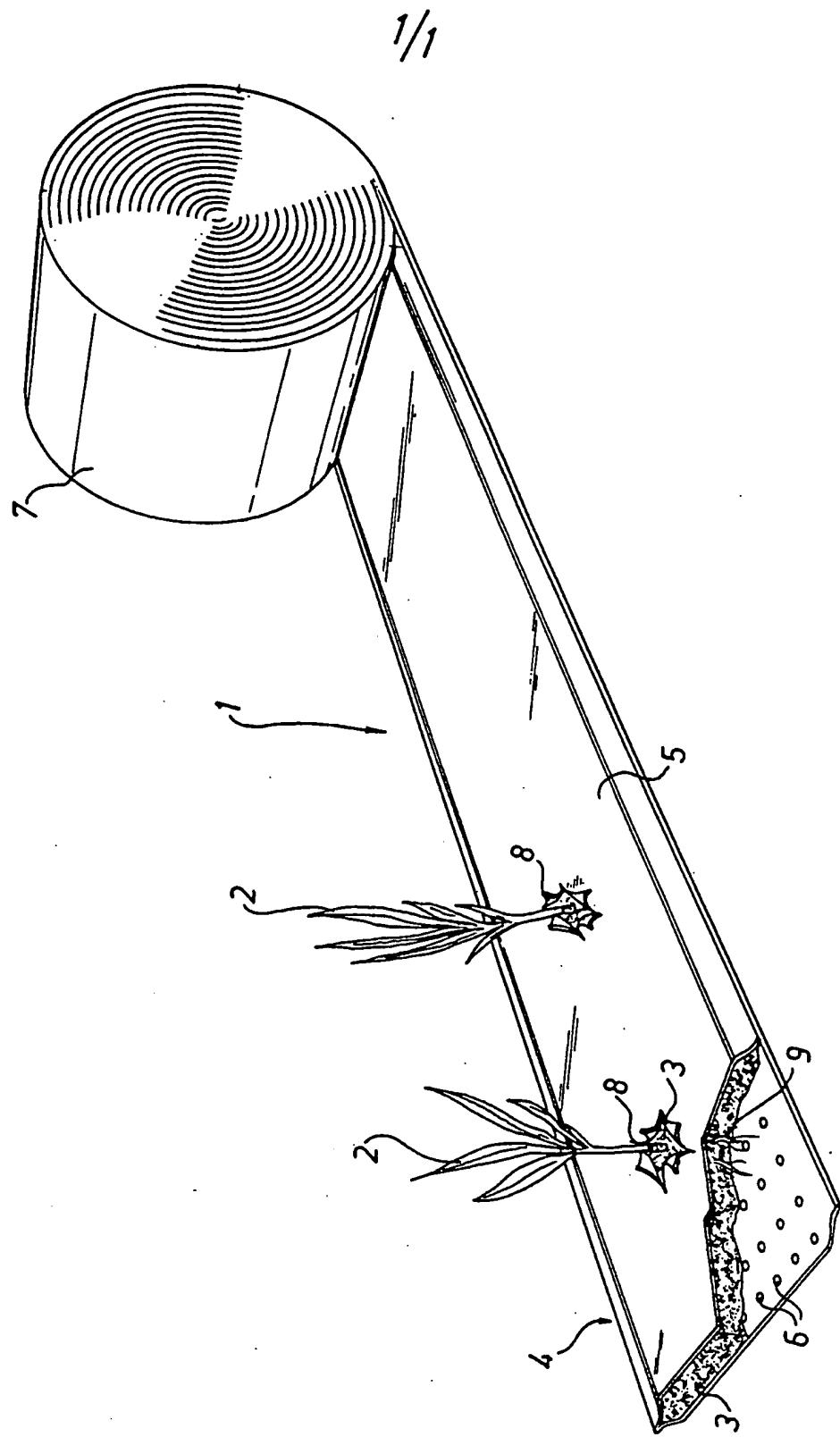
3. A substrate as claimed in claim 1 or 2, characterized in that the wrapping (4) with 10 the fibrous pulp material (3) contained therein is flattened to give it essentially flat upper and lower faces (5, 6) and in that it is rolled into a roll (7) which may be unrolled onto a support to form a mat.

4. A substrate as claimed in claim 2 or 3, 15 characterized in that the wrapping (4) is made from recyclable synthetic resin or from wet-strength paper.

5. A substrate as claimed in claim 2 - 4, characterized in that the upper face (5) of 20 the wrapping (4) may be cut for insertion into the cuts (8) of plants (2), allowing the plant root system (9) satisfactory contact with the fibrous pulp material (3), and in that the lower face (6) of the wrapping (4) is perforated for drainage purposes.

25 6. A substrate as claimed in any one of the preceding claims, characterized in that the fibrous pulp material essentially consists of fluff (3).

7. A substrate as claimed in claim 6, characterized in that the fluff (3) is not refined and 30 in that such substances as nitro-ammonium compounds, sodium and sulphur, essentially have been removed therefrom.



INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/SE 94/00275

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: A01G 9/10 // A01G 31/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: A01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SE, B, 349225 (AMERICAN CAN COMPANY), 25 Sept 1972 (25.09.72), claim 1 --	1
X	EP, A1, 0147349 (SOCIETE FERTIL'AQUITAINE (SOCIETE ANONYME) ET AL), 3 July 1985 (03.07.85), claim 1 --	1
X	WO, A1, 8503192 (HEINSTEDT, DAVID), 1 August 1985 (01.08.85), figure 2, claims 1,3 --	1,2,4
Y		3,5
X	WO, A1, 8102968 (METZELER A/S), 29 October 1981 (29.10.81), abstract --	1,6,7

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

- "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

29 June 1994

Date of mailing of the international search report

14 -07- 1994

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. + 46 8 666 02 86

Authorized officer

Ingrid Falk
Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/00275

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4972627 (KAZUO HORI ET AL), 27 November 1990 (27.11.90), column 1, line 65 - line 67, figure 1	1
Y	-- -----	3,5

INTERNATIONAL SEARCH REPORT
Information on patent family members

28/05/94

International application No.

PCT/SE 94/00275

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
SE-B- 349225	25/09/72	NONE		
EP-A1- 0147349	03/07/85	SE-T3- CA-A- FR-A,B-	0147349 1261162 2556930	26/09/89 28/06/85
WO-A1- 8503192	01/08/85	AU-A- EP-A-	3884185 0168468	09/08/85 22/01/86
WO-A1- 8102968	29/10/81	AU-A- EP-A-	7152781 0050140	10/11/81 28/04/82
US-A- 4972627	27/11/90	EP-A-	0322179	28/06/89